The Hungarian Technology Foresight Programme

AGRICULTURE AND FOOD INDUSTRY

Panel Report

BUDAPEST
2000

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In 1998 the National Committee for Technological Development (OMFB) launched a technology foresight programme named TEP after its Hungarian acronym. The main objective of the programme was to make a contribution to improving the long-term competitiveness of the country's economy. This would enable new opportunities to be identified in the development of both the market and technology that would improve the quality of life of the population. By analysing major changes in the economy and society as well as new achievements in science and technology, TEP defines the key issues and the areas where strategic decisions need to be made that will be crucial for the country's development in the next 15-25 years.

The Steering Group and the thematic panels have assessed the current situation, outlined different scenarios for the future, and formulated their recommendations to implement the favoured approach.

The thematic panels analysed the key aspects of the following, closely interrelated areas:

- Human resources (education and employment)
- Health and life sciences
- Information technology, telecommunications and the media
- Protection and development of the natural and built environment
- Manufacturing and business processes
- Agribusiness and food industry
- Transport

The TEP reports, analyses and findings of the Delphi survey may be accessed electronically via the home page of the Hungarian Ministry of Education at the following website address: http://www.om.hu.

MINISTRY OF EDUCATION OF THE REPUBLIC OF HUNGARY

Published by TEP, the Hungarian Technology Foresight Programme
Publisher-in-chief: Ferenc Kováts - Chairman of the Steering Group of TEP
Published by the Hungarian Technology Foresight Programme (TEP)

ISBN 963 00 5362 4

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Introduction

The contribution of the Hungarian agricultural and food industry sectors to the GDP is about ten per cent. The country's favourable geographical location, its traditions, and the search for answers to the important challenges likely to be posed by Hungary's integration into the EU all call for special treatment of this field for social, economic, and political reasons alike.

The 90s have brought significant changes in this area as well: the ownership structure has changed fundamentally, and the same is true for both production and market conditions. The orientation of Hungarian exports is also radically different today from what it was fifteen or twenty years ago. If all these factors are tallied and analysed, and then realistic scenarios are drawn up based on the results, we will be in a position to chart out the best direction of development open to us, together with the necessary measures—in the form of proposals and recommendations—to be taken to reach that objective.

Current Situation (a Snapshot) and Immediate Tasks

A Horizontal Approach

The Food and Agricultural Sector's Place within the Hungarian Economy

The agricultural and food sector continued to be an important part of the Hungarian economy during the 90s, even if its contribution to the GDP was on the decline (see Table 1). However, if related industrial and trade activities are also considered, the contribution of the entire "agribusiness" sector to the GDP is much higher; some estimates place it in the region of 20 per cent.

Table 1: Share of gross domestic product (GDP) at current prices (per cent)

Year	Agriculture*	Food Industry**	Total
1991	8.5	5.0	13.5
1996	6.6	4.0	10.6
1997	5.2	3.3	8.5
1998	5.5	3.8	9.1

*Including gamekeeping, fisheries, and forestry.
** Including the beverage and tobacco industries.
Source: Agricultural Statistics Yearbook, Hungarian Central Statistical Office (HCSO) , Budapest 1997
Hungarian Statistics Yearbook, HCSO, Budapest 1998

The changes in the number of full-time employees working in these sectors accurately reflect the developments of the past decade (*Table 2*). The food sector saw a cut in the number of wage earners—in excess of the overall drop in employment in the economy as a whole. It must be remembered, however, that quite a few of the active wage-earners

of the 90s are operating today as businesses only out of necessity – so-called "forced entrepreneurs" – as a result of the changes in landholdings, privatisation, and other economic factors. The number of people engaged part-time in the secondary branch of the industry is about 700 thousand.

Table 2: Employment figures for full-time wage-earners

Index	National economy, total	Agriculture	Forestry	Food Industry
Number of active wage-earners (in thousands, 1990)	4795.2	813.3	50.0	203.0
Number of active wage-earners (in thousands, 1997)	3611.4	294.3	15.6	118.7
Relative proportion in comparison to the total number of active wage-earners in the national economy (per cent, 1990)	100.0	17.0	1.0	4.2
Relative proportion in comparison to the total number of active wage-earners in the national economy (per cent, 1997)	100.0	8.1	0.4	3.3

Note: The figures on the food industry only include data on businesses with a staff of over 20 persons after 1993.

Source: Agricultural Statistics Yearbook, HCSO, Budapest 1997

The sector also played a positive role in contributing to the balance of foreign trade. In 1998, agricultural products and foodstuffs made up 12.1 per cent of total Hungarian exports.[1] With regard to products in this range, Hungary is a net exporter (with exports amounting to more than double the imports).

Taking the index figures of the year 1990 as 100, the parity ratio[2] had risen to 137.3 by 1997, showing a clear deterioration in the position of the agricultural sector. That trend continued in the years 1998–1999 as well.

The index figures for the gross volumes of agricultural production also showed a falling tendency in recent years. *(Table 3)*

Table 3: *Index figures for the gross volumes of agricultural production at comparative prices (1990 = 100)*

Year	Agricultural and horticultural produce	Livestock and animal products	Agriculture, total	Food industry, total
1991	104.0	84.4	93.8	93.2
1992	77.3	73.8	75.0	89.5
1993	70,2	66.1	67.7	85.6
1994	77.0	63.3	69.8	90.3
1995	78.5	65.5	71.6	91.8

[1] HUF 256.4 billion (which is more than USD 1 billion at 1998 prices)

[2] The price index of industrial goods utilised in the production of agricultural produce divided by the price index of prices received by agricultural producers.

1996	86.2	66.6	76.1	91.4
1997	84.4	62.6	73.2	84.8
1998	76.8	66.3	71.8	85.6

Source: Hungarian Statistics Yearbook, HCSO, Budapest 1998

Natural Resources and Land Use

An evaluation of available natural resources must involve examination of the soil, the climate, and water conditions on the one hand, and also the structure of landholdings and the use of land on the other. Hungary's ecological conditions are favourable, with about 65 to 70 per cent of the land being arable. One-third of that total area, however, is relatively less suitable for agricultural production. About 18 to 19 per cent of the land in Hungary is woodland.

While the available sunshine is sufficient to meet the requirements of the vegetation to an almost unlimited extent, in many places the water supply available for the crops is insufficient from an agronomic point of view. This is not only a limiting factor; it is also a source of risk. Three or four out of every ten years are usually dry, even drought-stricken. Consequently, we must consider it insufficient to have irrigation on merely 2 to 3 per cent of all arable land, i.e., ca. 150 - 200 thousand hectares.

The environmental conditions of Hungarian agriculture present a favourable picture in comparison with that of other leading European economies. Soil degradation and pollution of water resources on the surface and underground are less extensive, and are not caused, on the whole, by conventional agricultural methods.[3]

In 1998, nearly 80 per cent of all households held land of less than one hectare in area. (57 per cent of these proprietors had no more than 0.2 hectares.) Landholdings of 1 – 50 hectares represent a total of 671 thousand hectares, so their relative weight is not very significant. Private farms of over 50 hectares belong to only 0.3 per cent of all land-owning families. The property structure of private farms today is characterised by a disproportionate preponderance of micro-landholdings, although there is a noticeable tendency towards an increase in the average size of farms. This observable differentiation represents a strengthening of the larger farms, which also leads to a polarisation within the rural population. Those for whom agriculture is a secondary, part-time activity are more and more distanced from the class of agricultural entrepreneurs. All these developments indicate that *even in the generally unfavourable economic conditions of the past years, there has begun a development of transformation, making the financially strongest and largest agricultural enterprises into business-oriented, western-type farms.*

[3]While in the European Union the proportion of soils exposed to erosion and undesirable chemical effects is as high as 40 per cent, in Hungary the same figure is only 25 per cent. Soil quality is also better than the EU average, and the proportion of agricultural land with specifically favourable hydrological properties exceeds 50 per cent in Hungary.

Business Conditions

The world market events of 1998 and 1999 clearly showed, once again, that the Hungarian agro-industry is far too vulnerable in its relations to foreign markets. Hungary does not play a major role on the world market either as regards the volume of the goods it produces, or the financial strength of its participants in the market. The economic preponderance of the cereal and meat sectors in Hungary leads to the production and export of commercial commodities of rather undistinguished quality, on the whole, which makes it very difficult to achieve extra profits, and there is also a great deal of shifting in prices. A fundamental change of paradigm, a complete restructuring of production is inevitable before we can take better advantage of our resources in foreign markets.

The role to be taken by the state has been very inconsistent in the past decade. The frequent modifications made to the system of government subsidies do not make it easy to plan in the longer term. Intuitive, instinctive decision-making on future price conditions is much more typical, particularly in the case of family farms, than careful, analytical business planning.

While Hungarian agriculture has pulled through its crisis, the conditions are not yet present for taking off on a new growth trajectory. The development of the necessary institutions is lagging. Not every participant in the agro-economy is equally interested in having transparent and clear-cut market conditions in Hungary.

Domestic Consumption

A slight drop may be observed in the daily per capita consumption of food during the 90s, which in itself would not be cause for alarm. The chief problem is that a very great spread can be seen around the national average. While luxury consumption is growing among certain groups of society, the nutrition figures for about one-quarter of the population are less than satisfactory.

Table 4 illustrates the consumption of staples and other foods given in natural units. The fall in domestic consumption increased the proportion of the undernourished within the total population, and also had an unfavourable impact on the foodstuffs market. By the end of the decade, several elements of the food consumption situation had begun growing, and particularly the more modest income groups have shown positive developments.

Table 4: Per capita consumption of staples and other foods, in natural units

Produce	1990	1995	1996	1997
Meat and meat products, total, in kg	73,1	63,1	60,1	58,9
Fish, in kg	2,7	2,7	2,5	2,7
Milk and dairy products, in kg	169,9	133,4	138,0	158,4
Eggs	389,0	300,0	270,0	270,0
Fats and oils, total, in kg	38,6	37,1	36,1	36,6
Flour, in kg	106,2	84,1	80,8	83,9

Rice, in kg	4,2	5,0	4,8	5,3
Potatoes, in kg	61,0	60,9	67,0	66,1
Sugar, in kg	38,2	37,7	40,3	39,9
Vegetables	83,3	91,6	90,3	98,8
Fruit	72,3	58,3	64,4	62,8

Source: Agricultural Statistics Yearbook, HCSO, Budapest 1997
Hungarian Statistics Yearbook, HCSO, Budapest 1998
Hungarian Statistics Pocketbook, HCSO, Budapest 1998

The effects of nutrition on health and the quality of life are obvious. Thus, according to available data, more than half of all deaths in Hungary are due to heart and circulatory diseases and a quarter to malignant tumours. The risk factors involved in nutrition are quite easily definable: excessive intake of calories, fats, cholesterol and salt, and insufficient intake of antioxidants (ascorbic acid, beta-carotene, zinc, etc.) Men consume about twice as much fat, women about one-and-a-half times as much as necessary. More than half of the excess fat consumption comes from fats used for cooking and bread-making. In the case of cholesterol, too, men consume twice, women one-and-a-half as much as the acceptable level of 300 mg per day. This situation increases the chances of arteriosclerosis. Sodium chloride (salt) intakes are four times higher than recommended levels in the case of men, and three times higher in the case of women.

55 to 60 per cent of the energy requirements of an adult should be provided for by means of carbohydrates, with sugar consumption preferably remaining below one per cent of the total energy intake. This latter requirement is often disregarded in Hungary. 42 per cent of the male population are overweight, 21 per cent actually obese, while in the case of women the respective figures were 28 and 22 per cent in the years 1992-1994. Studies have shown that it is not the quality or types of foodstuffs available on the market that are responsible for these negative statistics but eating habits and practices.

Education, Training, Innovation and Technological Development

For a competitive business culture, the education and training provided by trade schools, trade secondary schools, and post-secondary schools are equally indispensable.

While the number of students finishing trade schools fell significantly in the course of the 90s, the number of students in agricultural secondary trade schools and graduates from secondary schools showed a major increase[4]. The efficiency of the process of transferring knowledge in the secondary and post-secondary professional schools could best be improved by focusing more on the practical aspects of the training process. However, the training farms and plants returned to the various agricultural training schools as part of the privatisation process are often burdened with obsolete technologies, decrepit machinery, and the minor attempts and improvement carried out in recent years lacked coordination. In 1999, the Ministry of Agriculture began a programme of modernisation, in cooperation with the Ministry of Education, aimed at comprehensive and coordinated development.

[4] The figure nearly doubled between 1991 and 1997.

The number of students enrolled in post-secondary training grew significantly in the 90s. In 1991 the number of day students was 7,361, whereas the same figure had risen to 14,292 by 1997. A still more pronounced increase took place in respect of the number of students in correspondence courses: (1991: 1,438 students; 1997: 12,253 students). More and more graduates are also taking up farming.

Research and development activities play a major role in the exploitation of Hungary's favourable conditions for agricultural production, but the position of R&D must be strengthened further. The current, considerable research capacity is linked through numerous ties to the education system. There are sixteen independent research institutes operating today in Hungary in the fields of agriculture and food processing. In addition, there are another 167 research sites at various post-secondary schools and universities, and seventeen further laboratories are operated by business firms. The number of R&D units and their personnel have decreased in the past decade. The internal structure of research has also altered: the relative proportion of basic research, leading to new discoveries, has fallen, and the proportion of commercial services has grown—due to the pressure of financial considerations. Unless the government takes firmer steps (both as a source of orders for specific research projects and in creating the necessary infrastructure) in order to increase the proportion of basic research, the efficiency of the commercial services will also suffer in the long run.

It is definitely a negative finding that the number or scientific personnel at either agricultural or food industry R&D sites fails to reach 50 per cent of the total number of staff. It is still more worrying that the average age of research personnel is increasing, there is a shortage of new, younger staff due to low salary levels, and more and more young scientists choose to work abroad.

The R&D sector also suffers from the same general shortage of capital that afflicts the whole country, and from the cuts in government funds and financial resources that have helped maintain research institutes and infrastructure at a survival level, at least. With the increasing role of foreign direct capital in the country, businesses have less interest in supporting domestic research. While the privatisation process has led to a drastic reduction in the economic role of the state, it has failed to create a new 'source of demand' for R&D. Comparative studies show that countries where agriculture plays a much less important role (e.g., Ireland) spend two or three times as much on agricultural research and on supporting institutes involved in agricultural research than Hungary.

It is extremely difficult to find the financial sources required for the changeover. The large volume of postponed (never implemented) capital expenditures which are so much overdue in the agro-industry are also proving that fact. Today the task is not just to expand production and undertake technological modernisation, but also to execute—often very costly—transformation and reconstruction work that needs to be carried out in order to meet the environment protection or food hygiene regulations of the European Union.

The creation of a professional advisory network began in 1998 with the organisation of regional know-how and professional advisory centres. In addition, a free advisory service was launched in 1999 for the lower income groups that fall outside the competitive sphere of the economy. A great deal of interest has been shown in the

further development and operation of a network of model plants and farms run as part of the advisory service.

A Vertical Approach

Field Crops

More than half of the total area of Hungary is cropland: some 4.7 million hectares. Ecological conditions vary a great deal. About four to five per cent of the total area (180 to 220 thousand hectares) has been out of cultivation for years, mainly because of unfavourable soil and environmental conditions.

About 60 per cent of all Hungarian cropland is used for growing cereals, 12 to 13 per cent for oilseed plants, 2 to 3 per cent for sugarbeet, 1.2 to 1.5 per cent for potatoes and leguminous plants, and 8 to 14 per cent for fodder and succulent feed-crops. In recent years, vegetables have been planted on about 2 to 3 per cent of the land.

In the course of history, the various regions of the country have acquired their own characteristic agricultural features, best represented by the particular type of crop or livestock that may best be cultivated or bred in the given area.

A great challenge is being faced by Hungary in the fight against weeds. Particularly in fallow or non-cultivated lands—but also on lands under cultivation—there has been a great proliferation of weeds, which, in addition to causing economic losses, are also responsible for serious illnesses. This is particularly true of allergenic plants, of which ragweed *(Ambrosia elatior L.)* tops the list.

Horticulture

Horticultural production represents about 15 per cent of total agricultural output. The incentive that this type of agricultural activity provides for rural populations not to move away from their homes is particularly strong. Currently, 370 thousand hectares are used for fruit and vegetable growing, and 25 to 35 per cent of the produce is exported.

The efficiency of the exploitation of agro-ecological conditions varies. Plantations are situated in favourable locations, but the varieties grown often fall short of the requirements of the market. However, the weakest point of the sector is the lack of spontaneous associations on the part of producers and the absence of marketing activity, which is indispensable on foreign markets.

Vegetables are grown on approximately 100 thousand hectares, and the annual output is about 1.5 million tons. Plastic-foil tents of a total area of about 3,500 hectares, frameless flat-foil hotbeds of about 2,000 hectares, and glass hothouses of about 70 hectares are used for force-growing pre-seasonal crops. Private farms, most of which are small family farms, produce 90 per cent of the vegetables on the market. All possible assistance must be given to the development of business associations and new-type cooperatives.

Following the cuts experienced in the past decade, the total area used for *fruit* growing is about 90 to 95 thousand hectares, with an annual production of about 700 thousand tons. The average age of the orchards is high; more than half of them are over 20 years

old. *Apple* production, for which the ecological conditions in Hungary are very favourable, is preponderant. However, the varieties grown do not meet changing market requirements. The greatest part of the crop is processed by the food industry, which affects the producers' revenues unfavourably. New, marketable varieties must be planted to increase the proportion of apples grown for fresh consumption. Modern storage capacities must also be increased. Of drupe fruits, *plums* and *sour cherries* are grown in significant quantities. The production of sour cherries is likely to increase further in the future, and the appropriate varieties are available to serve that objective.

Of the 130 thousand hectares of *vineyards* registered in Hungary, 72 per cent is concentrated in 20 wine-producing regions and 18 wine-producing locations. Grape cultivation has pronounced regional significance. The vineyards in cultivation are for the most part too old, and systematic re-plantation is inevitable. The ecological conditions are excellent for producing white wines and quite good for red wines in some regions, but not so good for growing table grapes. 80 per cent of the wine grapes are used for making white wines and 20 per cent for red wines. Export revenues are close to USD 100 million a year. 20 to 25 per cent of the produce is exported. A positive new development is the emergence of family wine-cellars, along with a growing number of top-quality wines on the market.

Many of the medicinal and other herbal products from Hungary are considered a Hungarian speciality throughout the world. The land area used for growing herbs is 35 to 40 thousand hectares. The collection of herbs grown in the wild is also significant and makes up about 40 to 45 per cent of the total volume. Herb cultivation may become one of the most promising branches of horticulture in Hungary.

Forestry, Game and Fisheries

Forestry plays an important role in the utilisation of land in Hungary, as it is the second most important form of land use after field crops. About 25 per cent of the current 1,871 million hectares of forests are protected. Forest density in the country is nearly 19 per cent. This figure has been growing continuously since 1945 (when it was 11 per cent), due to systematic forestation work. The stock of live timber is also growing, and the total stock of timber in the country's forests is 310 to 320 million cubic meters.

The importance of woods is going to increase in the future, both for environmental and land use reasons. Part of the fields withdrawn from traditional agricultural exploitation is used for forestation. As a result, by the year 2025 the forest density in the country may reach the desirable 25 per cent figure.

The demand for timber cannot be met by domestic production. Even with growing lumbering, an important quantity of timber of the variety not grown domestically (pines) must be imported from abroad at present and this will likely continue to be so in future as well. However, import costs can be balanced by the export of wood products.

Game farming contributes to the economic attraction of a region, while it fits smoothly into the country's ecological and economic system. The services and products provided by this branch sell well on the foreign markets. With the rise of rural tourism, Hungarian game farming will also gain in importance and may continue to be a success story in the long run, too. At present, 25 thousand foreign hunters visit the country annually to hunt trophies besides the 50 thousand Hungarian hunters, and the HUF 10 billion in revenues

generated by them annually is an important factor for the operation and future development of this sector.

As healthier eating habits receive more and more emphasis, domestic fish consumption is likely to grow. This growth in demand may have a favourable effect on the Hungarian fisheries sector. As land with unfavourable agricultural properties is taken out of crop farming at an increasing rate in future, there will be more space available for building new fish ponds.

Animal Husbandry

The number of staple livestock, as well as the production of livestock for slaughtering, fell by nearly 50 per cent over the past ten years. The explanation for this is the drop in domestic consumption, the loss of eastern markets, worsening farming and feeding conditions, and the significant changes in the market regulatory system. The legal framework and institutional system to fit the requirements of a market economy have developed relatively fast, but the yearly shifts in the system of farming subsidies and financial assistance have made long-term, careful planning and the execution of necessary investments impossible. The integration into the European Union demands a revision of policy on animal husbandry and a radical improvement of our competitive position.

The total number of *pigs* has fallen to about half—in comparison with the peak figures of the mid 80s—and is about 5 to 5.5 million today, half of which figure come from small family farms. A number of large pig farms have closed down, while those still operating are in a run-down condition, and feed prices have also gone up substantially.

The poultry sector has been characterised ever since the late 70s by close, vertical integration. Particularly chicken and egg production increased spectacularly in the past decades. Goose production plays a major role in exports. In recent years, poultry raising has also fallen back, but the rate of reduction has been lower here than in the animal husbandry branch as a whole. While more than 60 per cent of exports went to the eastern markets a decade ago, today's market structure is characterised by the decisive position of the European Union with a share of exports totalling over 70 per cent.

Although the number of *cattle* is relatively small, milk production indexes have improved thanks to a greater concentration of herds. However, these index figures are still below the European Union averages. There is sufficient supply to meet domestic demand. Beef production figures per head of cattle are not significantly different from European Union averages but fall behind Dutch, Belgian, and Irish results. Cattle raising must receive particular attention in the future, too, for improved pasture management, among other things.

Since *sheep* raising is based on coarse fodder, sheep may play a decisive role in the exploitation of pasture land, which is currently 1.2 million hectares and is on the increase. Market conditions for ewes' milk and lamb are favourable. Yet the number of sheep has suffered a serious cut. Lamb production per ewe is 12 to 13 kilograms, which is 80 to 82 per cent of the EU average, but merely 55 to 58 per cent of Irish index figures.

The *horse* is the only commercial animal whose numbers have not fallen in the past ten years. Domestic demand is gradually increasing, but horse exports are directed almost exclusively to Western Europe. The greater part of exports consists of slaughter-horses, but our competitive position has also been improving in the market of horses for sport and breeding purposes.

Hungarian honey, produced by honeybee colonies, may also be considered a speciality. Annual production is in excess of fifteen thousand tons, of which exports amount to ten to thirteen thousand tons. Domestic honey consumption is very low, about 0.4 kilograms per capita per year (this figure is more than three times as high in Austria).

Food Industry and Trade

The Hungarian food industry sector produces a total of nearly 1,200 billion forints.[5] The number of firms with annual receipts of over one billion forints is about 200, and they represent nearly 90 per cent of the total revenues generated in the food industry. This sector provides almost one-sixth of total export revenues. Businesses employing more than ten people in the production of foodstuffs, beverages, and tobacco products number about 1,200. The total number of people employed in the sector is over 120 thousand. A characteristic feature of the Hungarian food industry is the fact that nearly two-thirds of the 200 largest firms are in foreign majority ownership. In spite of increasing concentration, monopolies have not developed in general, and neither is there any immediate danger of monopolies emerging in the near future.

The decline in production experienced in the food industrial sector came to a halt in 1993, and then a slight recovery followed. Productivity improved by 8 to 10 per cent annually. Around the mid-90s, the production of soft drinks and the processing of fruits and vegetables were expanded. The repeated crises of the eastern markets broke the wave of development in the latter sector in 1997-98. The gross total output of the entire food industry sector has stabilised at about 85 per cent of the 1989 level.

Between 1992 and 1995, the privatisation of the industry accelerated and spectacular developments were achieved in certain areas, although these were primarily financed from foreign working capital. The share of foreign capital in the entire food industry has by now exceeded 60 per cent. The involvement of foreign capital has improved capitalisation, reduced liquidity problems, and rationalised business management.

The appearance of multinational supermarket chains has created a new situation on the Hungarian food retailing market. In this area, concentration was achieved faster than elsewhere. The food industry's reaction to these changes was rather belated and not always adequately thought through. Good quality, attractive packaging, large variety, and an appropriate stock of goods of the required quality have meanwhile become fundamental conditions for becoming a supplier to a supermarket or hypermarket. The majority of the companies have successfully handled these challenges. However, the Hungarian industry was not sufficiently strong in capital to handle the longer terms of payment. A revision of the legislative regulations on competition must be carried out. In the absence of such revision, one cannot expect balanced growth in the food sector, and imbalances may lead to social tensions. The collapse and transformation of the eastern

[5] At current exchange rates this corresponds to USD 4 billion.

markets also represented a great challenge to the industry. With a few exceptions (meat packing, canning), the market has adapted to the new situation: in general, the European Union's share in buying Hungarian products has increased.

The Hungarian food industry constitutes the most important partner of the Hungarian agricultural sector, as some 70 to 80 per cent of all agricultural produce reaches the market after processing. An under-capitalised food industry is very limited in its ability to act as integrator of agricultural production, or as intermediary in the transmission of market requirements.

Scenarios

Methodology

The variables in the macro-scenarios drawn up by the TEP Steering Group are applicable to both the agricultural and the food industry sectors. In both cases, the general environment determined by the activity of the participants and by global influences (trends) is of fundamental importance. Nevertheless, certain differences also arise as a result of specificities, as follows:

- as regards integration, a distinction should be made according to whether the process is initiated from within the food industry, or the integration process is centred around a point which is external to the sector;
- as regards the level of knowledge-intensity, the watershed may consist in whether modern know-how is possessed only by a limited group, or by a wide range of those engaged in the industry;
- a high level of activity presupposes a high level of knowledge (and *vice versa*), while on the other hand the state also has an important role to play in bringing about such high level of activity; we cannot see how the scattered and disunited participants in the market could be organised and oriented in any other way in the next 10 to 15 years;

These independent variables define relatively well the following dependant variables:

- the number of people employed in the food sector, particularly in agriculture;
- optimum landholdings and production structure;
- new opportunities for the food industry and trade sectors;
- the framework of education, research and development, and professional consulting;
- chances of realising the "green alternative".

The following takes a closer look, from the point of view of the agricultural and food industry sectors and in terms of the above dependant variables, at the situations defined by the macro-scenarios discussed in the report produced by the TEP Steering Group.

Scenarios

Scenario . 1: "Horticulture-centred" model

In this model, the Hungarian food sector integrates into the world economy at a high level and by its own efforts. A large proportion of the market participants acquire the necessary skills to make use of knowledge-intensive processes. The spontaneous associations and activities of the civil sphere and the active role adopted by the state mutually reinforce each other.

According to certain optimistic forecasts, in the next twenty years the income of the population is going to grow at a rate of four to five per cent yearly, which is higher than the European average. This means that by 2020, per capita consumption will be at least two and a half times higher than today, while the relative proportion of foodstuffs and other consumables will fall to 20 to 25 per cent. The consumption patterns of that part of today's population who constitute the top 30 per cent of the income pyramid will become general. Thus, food consumption and retail sales of foodstuffs will more than double.

The changes in the structure of domestic demand as well as in the export markets both induce us to work to achieve *a faster rate of growth in the areas of vegetable and fruit production, organic farming, and the production of seeds and seedlings than in the cereals and meat branches*.

The system of *producers' marketing organisations* must have a very special role. These organisations are formed in accordance with the requirements presented by the given product for preparation, storage, and distribution; production tasks are allocated on the basis of contracts made with processing firms, retailing networks, or purchasing companies; the preparation, stockage, and marketing of the product are all regulated and organised. The implementation of marketing and development programmes, or the operations of credit organisations may all easily be coordinated through them.

The priority accorded to the development of horticultural activities also means that up-to-date cultivation skills and knowledge must be propagated among a broader range of recipients, and that greater readiness to cooperate should be encouraged. It is impossible to keep the knowledge and skills of hundreds of thousands of people up-to-date and to sustain their readiness to cooperate with each other without a professional advisory system and consultation forms that attract public attention.

This growth/development scenario is particularly demanding as regards the *activity of the participants.* This is because in addition to the various institutional means that induce cooperation and create forums of communication to facilitate contact between people interested in producing and marketing a given product in association with others, it also calls for definite services on the part of the state. This model may only hope to be successful if and when there is a willingness and readiness among the business participants to cooperate with each other, or if they are at least prepared to respect each other's fundamental interests, and if the state sets up a system for organising land management and accepts responsibility for creating its share of appropriate services.

The variety in the sizes of landholdings survives and the concentration of land ownership becomes even more pronounced, mainly in the hilly regions of today. Along

with farms of several hundred, or even several thousand hectares of field crops, dairy, and extensive animal husbandry, two other forms of horticultural farms are found everywhere: (a) enterprises working the large fields as part of the crop rotation system, and (b) smaller horticultural farms forming permanent blocks, groups, clusters of mutual cooperation and sharing resources and services. Other than the large farms engaged in field crop cultivation and livestock raising, some of the horticultural farms are also capable of producing capital-intensive goods in large volumes. Beside the agricultural companies, single-ownership and family enterprises working only on a part-time basis also have an important role. The extended network of these provides the populations of the rural areas and peripheral urban districts with opportunities to supplement their income, and ensures a reliable source of seasonal labour typically required in fruit and vegetable farming.

Scenario 2 - "Drifting"

In this model, the structure of production will not change, and so the cereals and meat business remains preponderant. The process of *integration* continues, but the principal force behind it is the influence of the world market. Efficiency improves, and the number of participants in the market falls. The process of concentration accelerates. This scenario prognosticates a further increase in the economic weight of large farms and companies. The *technological knowledge and skills* required by market competition are only acquired by a small group of large enterprises. The non-governmental sphere is weak, there are few spontaneous initiatives for self-organisation, and small businesses are not active enough. The role of the state is unclear and undecided. The whole agricultural and food industry sector is relatively inactive, the processes are controlled for the most part by external (foreign) participants, and only a few large businesses are able to devise and implement independent strategies.

Production grows by an average of 0.5 to 1.0 per cent per year. The rate of export growth is low. The total output of the food sector probably remains below the level of the mid-1980s.

Although the state supports the professional advisory system, the advisory service remains fundamentally profit-oriented, and it is only resorted to on occasion. The stability of landholdings and land use is only partially supported by legislation, so development and investment projects remain below both the optimum and the necessary levels. Credit and subsidy terms and conditions are not sufficiently clear and change frequently. The regulatory and support systems treat issues belonging to the competitive sphere in common with those of the social sphere, so the use of public funds is not sufficiently efficient.

This development model presumes a continuation of currently observable trends: a permanent division remains between those in the industry who are familiar with today's agrotechnology and the possibilities it offers, able to create networks and associations to achieve the degree of efficiency called for by the market, and those, on the other hand, who are left to rely on sporadic information and choose to produce at random whatever they happen to be able to produce by the means that happen to be at their disposal. In

this model, too, however, an educated and informed group of entrepreneurs and managers are able to keep up with the advances in agronomic science.

Scenario 3 – 'Green Alternative'

We must accept the long-term (30 to 50 years' time horizon) importance of a scenario that foresees a course of development involving a high intensity of knowledge and leading, with an active strategy, to integration into a very different world with substantially different values than those prevailing today. The objective is to build a social and economic system that is sustainable both socially and ecologically. This new model assumes a great deal of *activity* on the part of the state, non-governmental community groups and individuals alike. This 'green alternative' requires the most radical change in our general attitudes to life, and also the highest degree of government activity. The philosophy of 'consumption for the sake of consumption' is replaced by the goals of satisfying real needs and requirements. Several materials and ingredients will no longer be used (e.g., artificial preservatives and colouring). As a result, many staple foodstuffs can only be stored for shorter times. Because of shorter storage periods, it becomes important to meet local demand from local sources, whenever possible.

In this scenario the proportion of mass commercial products is the smallest and the share of special-purpose articles the highest. Since the price ratios of the future will be completely different from those of today and the structure of consumer demand will also change, most of the local demand may efficiently be met by an appropriate organisation of small, local food-industry enterprises. With the increasing emphasis on healthy, natural ways of life, the protection of the natural environment becomes more and more important. Rural tourism gains a great deal of momentum and becomes a significant source of employment as well.

Reflections on Selecting a Model

The conditions for the export of Hungarian agricultural and food products already exist, as long as the quality and the price are competitive, and the conditions of production and processing meet international standards with regard to environmental protection and hygiene, etc. Particular attention should be paid to markets representing effective and solvent demand. Of these, the trends observed within the European Union are especially important to us. That market shows a growing demand for natural food products and goods intended for smaller groups of consumers with special requirements. Similarly, the demand for pre-dressed or pre-cooked food products is also continuously expanding. The consumption of both raw and processed vegetables and fruits is also going to grow in the European Union.

If the preponderance of average-quality mass commodities continues, there is no chance for breaking out of the present situation in the short term. The production of special-quality goods, meeting unique, individual requirements and incorporating the most up-to-date levels of skills and knowledge could provide the avenue for a breakthrough.

Finally, the European Union's scenario in the agricultural sector must also be dealt with. The European Union has also announced its own foresight programme, which is based to a significant degree on the national programmes of the member states. One of the studies in the programme also calls for specialisation in the agricultural sector of the

European economy, and foresees three clearly distinct regions for the future. In the northern areas of western Europe, it calls for the preservation of the landscape and stresses leisure and recreational uses. In the southern zones of the European integration, they recommend the production of special agricultural goods. Eastern Europe should concentrate on the production of mass commodities. The role assigned for the countries wishing to join the Union could easily develop by itself without any particular external intervention under the scenario described in the "drifting" model of development.

Conclusions and Recommendations

The prolonged crisis of the food sector and the recurrent dysfunctions of the market are to a great extent due to the failure to achieve a restructuring of our agricultural sector between 1988 and 1999—following the emergence of new global challenges. The cereals and meat products branch, with its concentration on producing mass commodity products, has remained dominant, while it is also the most exposed to market cycles and shifts. Production methods have only been updated in a few, isolated cases, and capital expenditures are insufficient. The deficiencies in the spatial organisation of agricultural activities and the deterioration of the infrastructure have had a negative effect on efficiency and product quality. The uncertainties related to the regulations on land use, the less than satisfactory legal measures taken to stabilise land ownership, the various obstacles in the way of new capital investment all hinder long-term investment and conscious and systematic land and landscape management.

Since in the field of cereal and meat production concentration is inevitable for both economic and quality-assurance reasons, and since no de-concentration is likely in the dairy industry, either, for similar reasons, an optimum exploitation of the natural resources of the countryside, and still more of the work force and enterprise of the population living from agriculture may only be achieved by substantially raising the proportion of knowledge- and labour-intensive activities (e.g., fruit and vegetable production, bio-products, production of seeds and seedlings) within the sector. The market conditions already exist for these activities, but vigorous, horticulture-type farming which meets contemporary user and consumer expectations requires a wider range of more knowledge-intensive operations and more complex systems of cooperation than the production of meat and cereals. To achieve the structural changes which will lead to a greater proportion of knowledge and labour-intensive areas, determined and long-term participation on the part of the state is indispensable.

Our recommendations support the realisation of the first scenario model, based on a fast development of knowledge- and labour-intensive activities integrated into a scheme of landscape management.

Socio-economic Recommendations

1. Agricultural activities must fit into a scheme of *landscape management*. For this purpose, norms must be set everywhere for cultivation and for maximum acceptable loads on the land and on the water supply. A system of landscape planning must be devised to regulate the spatial order of farming operations.

2. Appropriate legal means should be applied to facilitate a *permanent landholding structure*. This is the only way to open the road to long-term capital investment, responsible landscape management, and cooperation in the areas of land use and infrastructure.

3. The *micro-regional development programmes* must include plans for landscape management, infrastructural and institutional development on the basis of which cooperation between the participants may develop intensively. A *landscape management assistance scheme* should be set up in order to distribute the major portion of development funds in alignment with the micro-regional development programmes, integrated into the general landscape exploitation plan, and thereby facilitate the formation of entrepreneurial associations in the field of horticulture and organic food production, enable coordinated development of the infrastructure and contribute to the mutual reinforcement of the effects of the assistance given to individual businesses. Due to economic considerations, as a result of our integration into the European Union a certain part of the land will be taken out of traditional agricultural cultivation, but not out of rational land exploitation. If that changeover is not prepared with sufficient care, if conscious planning loses out to instinctive decision-making, a number of very negative results may follow. The optimum conditions of land use must always be formulated with reference to the given micro-region in view of local employment and landscape management considerations, and bearing in mind the importance of preserving soil quality and soil conditions.

4. A *spatial database system* must be set up which includes in an integrated form all information on land titles, environment, water supply, land use, and land registry data and plans. This database must serve as the starting point in the preparation and coordination of the work of administrators of state subsidies, professional consultants, service providers, and farmers alike.

5. An extensive and differentiated *advisory and adult education system* plays a very important role in the creation of a new business and cooperative culture. Therefore, both governmental and trade organisations should carry out the following tasks:

    - construction of a general advisory system;
    - accreditation of specialised consultation firms and, through the trade associations, provision of incentives to use their services;
    - creation of model farms organised according to sectors and geographic regions, which would also contribute to the diffusion of new knowledge and technologies.

6. Encouragement of *cooperation on land use* is an important condition for the development of optimum-sized croplands.

7. The role of *biotechnology*, in the broad sense of the term, will be more and more important. This discipline, as well as the practical application of its achievements must receive all possible support. The conduct to be followed by the state in this area should integrate the areas of licensing, support, and guarantees on safety.

8. The mainly fruit and vegetable producing sectors face the urgent tasks of organising and diffusing a network of *producers' marketing organisations* in the interest of the

coordinating production, pre-market processing, stocking, and shipping the produce to the markets.

9. A national *food safety* strategy should be devised to cover the whole sector all the way from the fields to the consumer, and its regular implementation must be ensured.

10. The association of chain stores and independent retailers into purchasing units is an important development of our time. This development is not dealt with satisfactorily by the regulations on *economic competition* that currently apply, and the food producing sector suffers as a result. For properly balanced development, it is indispensable to review and revise the relevant legal regulatory framework.

11. An inordinate proliferation of *weeds* may be observed. In addition to the economic losses caused by them, they are also responsible for certain illnesses (hay fever, skin irritations, etc.). The spread of *ragweed* should be considered particularly dangerous. Punitive sanctions as well as incentives should increasingly be applied in addition to new methods of weed control in order to achieve positive changes as soon as possible in the near future.

Scientific and Technological Priorities and Innovation Policy Recommendations

12. While the available sunshine is sufficient to meet the requirements of the vegetation to an almost unlimited extent, in many places the *water supply available for the crops* is insufficient from an agronomic point of view. As this is both a limiting factor and also a source of risk, strategic programmes should be launched in order to reduce the losses caused by periods of drought, and to devise careful utilisation of water supplies for the purposes of irrigation.

13. Hungarian *crop farmers* must find the special varieties and develop the production directions that are competitive on European markets, and possibly on other world markets, too. These include for example medical and other types of herbs, ornamental plants, numerous industrial plants, and also various energy-source plants (rape, fast growing varieties of trees, etc.).

14. Support must be provided for the further diffusion of *fruit and vegetable varieties* giving top-quality produce. Research and development must present more efficient production models and environmentally friendly crop-dusting methods, on the one hand, while subsidised programmes and a more effective advisory service should encourage small farmers even more to grow typically Hungarian varieties and products ("Hungaricums").

15. Efficiency of the *cereals and meat products* sector must be increased. Both in the course of research and development and professional consultation services, special attention should be given to exploring and publicising the market opportunities open to small farmers, because the combined application of the results achieved in the various different disciplines presents numerous new opportunities for small farmers too.

16. In the area of *livestock breeding*, the most important short-term task is raising efficiency. While focusing on that task, however, it must not be forgotten that in the

longer term the treatment of hazardous wastes and the reduction of water consumption will soon become the central problems in this branch.

17. A number of *small firms in the food industry* cannot be considered competitive in their present field of activity in the longer term. In many cases it is possible to change the main activity of the firms. Production (operating) models should be prepared and publicised and more intensive advisory work undertaken to reduce the likelihood of unsound capital investment decisions by small businesses, which already suffer from a shortage of capital, among other things. Innovation policy tools should be employed to encourage small and medium-sized businesses to form networks, to discover and disseminate modern production technologies, management and organisational methods, to jointly commission research by R&D teams associated with universities, the Hungarian Academy of Sciences, or other institutes to solve new technological challenges or to develop new production and manufacturing methods/tools.